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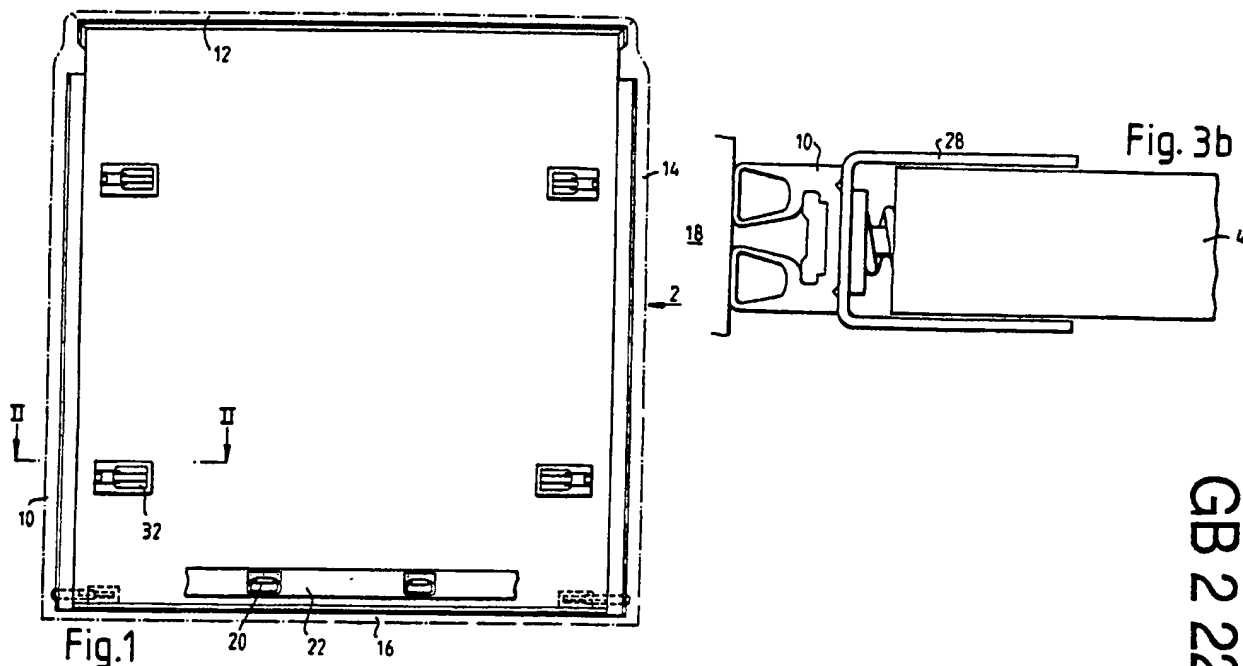
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(54) A bulkhead for dividing the load space of a refrigerated vehicle or container

(57) The bulkhead 2 has seals 10, 12, 14, 16 along its edges, at least one of which, eg 10, is secured to a support 28 which is mounted on but movable relative to the bulkhead. This allows the seal to be moved relative to the bulkhead to compress it against the well of the load space. The seals are formed from insulative materials, as is the support, to reduce heat losses in this area. Rubber is the preferred material for the seal and fibre reinforced polyester for the support.



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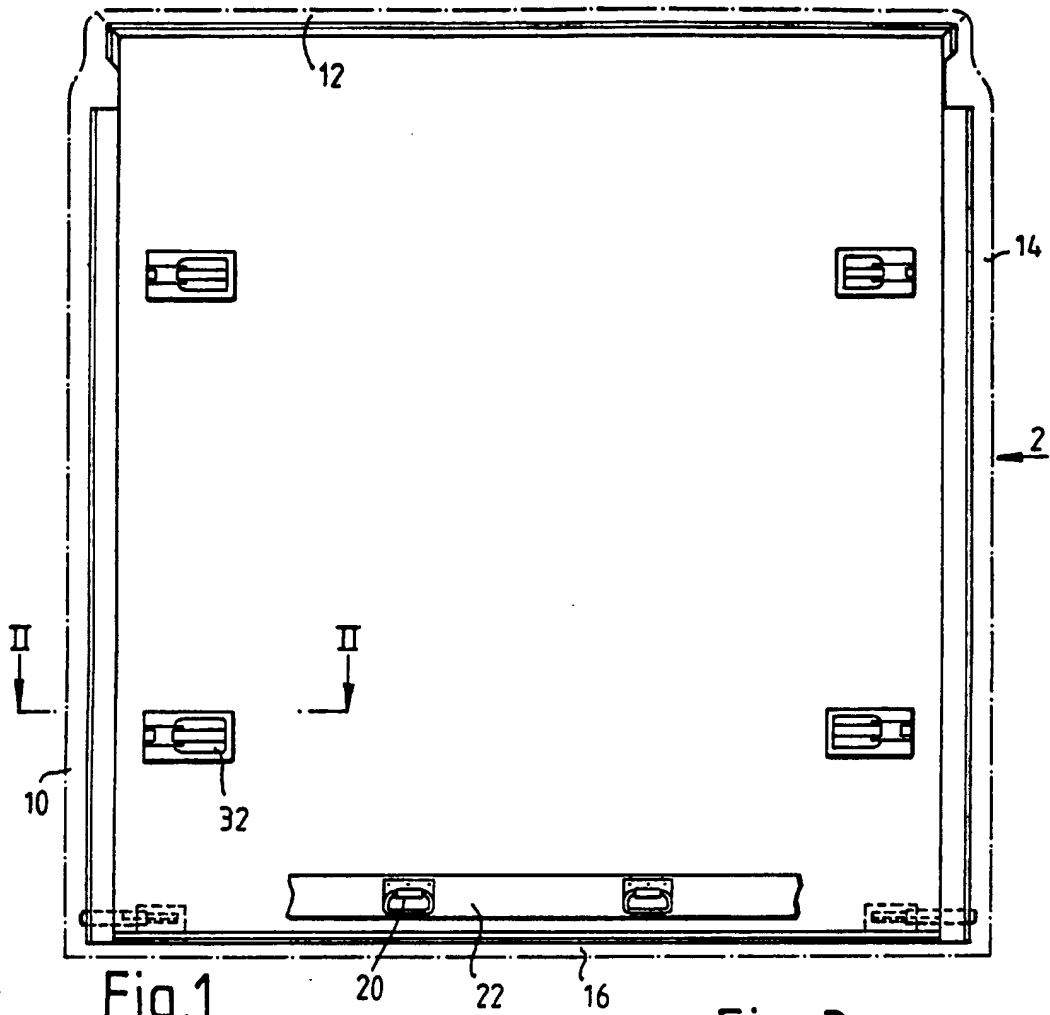


Fig. 1

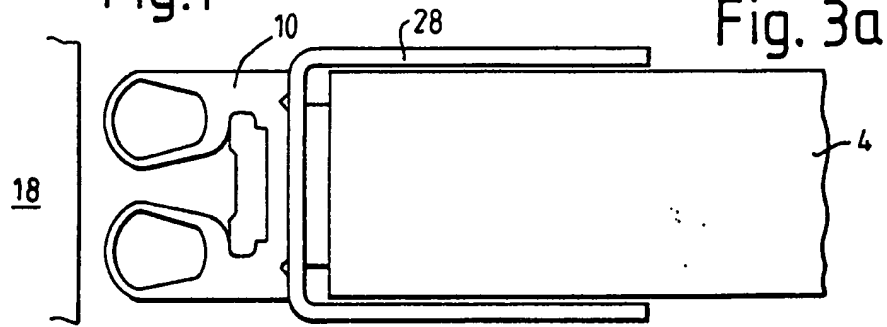


Fig. 3a

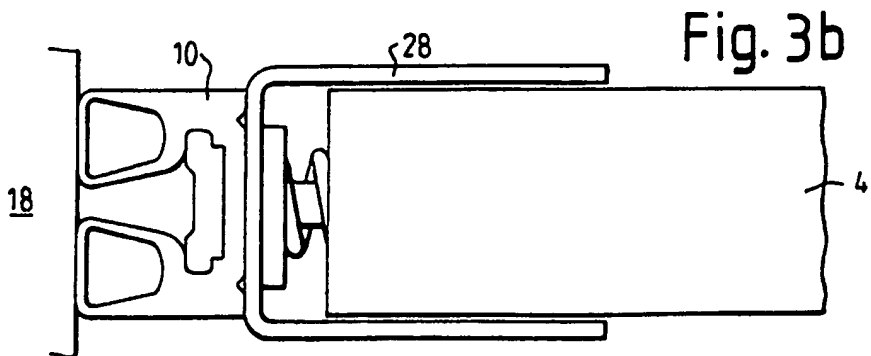


Fig. 3b

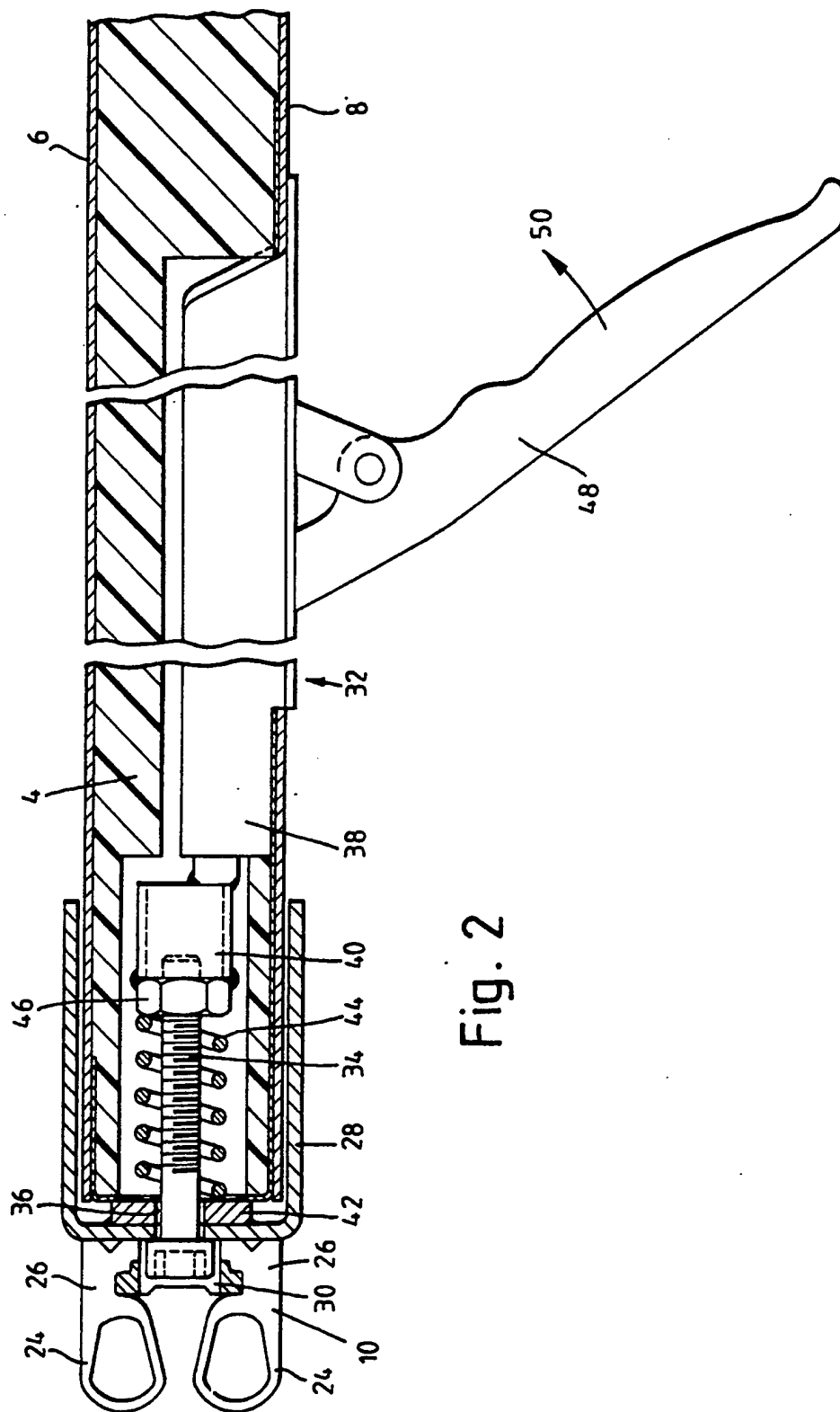


Fig. 2

## IMPROVEMENTS IN AND RELATING TO REFRIGERATED CONTAINERS

This invention relates to refrigerated containers and to vehicles such as lorries, trailers, semi-trailers or vans which include such containers and in particular to refrigerated containers with a load space which is divided into a number of compartments.

The division of the load space of a refrigerated container is carried out with partitions, normally in the form of an insulating panel, known as bulkheads. Bulkheads may be fixed in position or they may be capable of being moved within the container and secured in any desired location to give compartments of different sizes. One design of movable bulkhead is supported on a frame which allows it to be swung manually between a vertical position in which it forms the compartments and a horizontal position in which it can be moved within the container.

Known bulkheads have been provided with rubber seals on all four edges. These are arranged so that when the bulkhead is in the vertical position, the top and bottom seals are compressed between the bulkhead and the roof and floor of the refrigerated container but the side seals are uncompressed or only partially compressed. The side seals are then forced away from the bulkhead against the walls of the refrigerated container to fully compress them by seal actuation means provided in the bulkhead. One form of seal actuation means comprises a U-shaped channel positioned

around each side edge of the bulkhead, the seal being secured to the convex face thereof. The channels are held against the edge of the bulkhead by springs positioned within the bulkhead. To compress the side seals, the springs are forced outwardly of the bulkhead by levers hingedly connected thereto.

The U-shaped channels to which the side seals are secured are formed from metal, normally aluminium, and consequently the efficiency of the seals at preventing heat transfer between the compartments is not maximised since heat will be transferred by conduction through the aluminium channels.

A bulkhead for dividing the load space of a refrigerated container into compartments in accordance with the invention comprises a panel of insulating material, seals formed from an insulating material being provided along each edge of the panel, wherein at least one of the seals is secured to a support located around and movable relative to the edge of the panel, the support being formed of an insulating material.

Preferably the seal is formed from rubber and the support is formed from a plastics material which may be fibre reinforced.

Suitably the support comprises a U-shaped channel, the seal being secured to the convex face thereof

and the arms thereof being positioned either side of the panel. When the support is moved away from the panel the arms of the channel and the air gap therebetween provide good insulation against heat losses between the compartments either side of the bulkhead.

The bulkhead is preferably of the type which can be moved between a vertical and a horizontal position. When in the vertical position, the upper and lower seals are preferably fully compressed between the bulkhead and the refrigerated compartment while the side seals are partially compressed or uncompressed. The side seals are both therefore preferably secured to movable supports.

The arrangement substantially prevents heat losses between the compartments of a refrigerated container which is extremely important when, for example, frozen goods are to be held in one compartment while the next door compartment is filled with perishable goods and has to be held at ambient or higher temperatures.

The invention will now be further described by way of example with reference to the accompanying drawings in which:-

Figure 1 is a side view of a bulkhead in accordance with the invention;

Figure 2 is part sectional view along line II-II of Figure 1 and;

Figures 3a and 3b are views similar to Figure 2 with the detail omitted showing the side seal in the uncompressed and compressed positions respectively.

The bulkhead 2 comprises a panel of insulating material 4, for example, polyurethane with a skin 6, 8 of metal or plywood secured to each side by adhesive. The skins 6, 8 are themselves coated with a glass fibre reinforced polyester to render them waterproof. Seals, 10, 12, 14, 16 are provided along all four edges of the bulkhead 2 as shown in dotted outline in Figure 1.

The bulkhead is employed to divide the interior of a refrigerated container, the perimeter of the load-carrying spaced of which is indicated at 18 in Figures 3a and 3b. The bulkhead 2 is carried in the container by a frame which includes two sliders movable within rails provide along the upper corners of the container. The frame includes a strutting arrangement which allows the bulkhead to be positioned either horizontally, in which position it can be moved by means of the sliders and rails along the container to a desired location, or vertically as shown in Figure 1. Movement between the horizontal and vertical positions and vice-versa is effected by pulling handles 20 provided on kickstrap 22.

The seals 10, 12, 14 and 16 comprise two parallel spaced tubes 24 formed from rubber. The tubes 24 both have integral extensions 26 secured to a seal support 28. Intermedite the two extensions 26 and secured thereto is a U-chaped element 30 formed from a rigid material which strengthens the seal and prevents the extensions 26 from distorting under compression.

The upper and lower seals, 12 and 16, are fixed in place, that is, their seal supports 28 are rigidly secured to the panel 4 and are dimensioned such that when the bulkhead 2 is rotated into the vertical position they are compressed between the bulkhead 2 and the ceiling and floor of the refrigerated container.

The side seals 10, 14 are not compressed when the bulkhead is in the vertical position, see Figure 3a. To force them against the walls of the load carrying space, a number of seal actuation means 32 are provided within apertures in the panel 4, see Figure 2. Each seal actuation means 32 comprises a screw 34, one end of which passes through an aperture 36 in the seal support 28 and is connected to the strengthening element 30. The other end is secured to a locking shaft 38 via an intermediate member 40. Between the support 28 and the portions of the panel 4 around the aperture in which the seal actuation means is located is a washer 42 which is secured to the



support 28. A spring 44 is held in compression between the washer 42 and a bolt 46 secured to the other end of the screw 34 to bias the support toward the wall of the load space. The locking shaft 38 is hingedly connected to a locking handle 48.

When the handle 48 is pushed towards the bulkhead that is in the direction of arrow 50 in Figure 2 the locking shaft 38 is forced towards the wall of the load space. The support 28 is therefore also forced toward the wall which causes the seal 10 to become compressed see Figure 3b.

The support 28 is U-shaped so that when extended its arms cover the gap between the panel and the seal 10. The support is formed from a plastics material so that heat losses in this region are reduced to a minimum. Preferably it is formed from glass fibre reinforced polyester. In fact it has been found that the heat losses with this arrangement are about 10% less than with known arrangements described above.

Claims:

1. A bulkhead for dividing the load space of a refrigerated container into compartments comprising a panel of insulating material having seals formed from an insulating material provided along each edge thereof, wherein at least one of the seals is secured to a support mounted on and movable relative to the edge of the panel, the support being formed from an insulative material.
2. A bulkhead as claimed in Claim 1 wherein the seals are formed from rubber.
3. A bulkhead as claimed In Claim 1 or Claim 2 wherein the support is formed from a plastics material.
4. A bulkhead as claimed in Claim 3 wherein the plastics material is fibre reinforced.
5. A bulkhead as claimed in any preceding claim wherein the support comprises a U-shaped channel, the seal being secured to the convex face of the web thereof and the flanges thereof being positioned either side of the panel.
6. A bulkhead as claimed in any preceding claim wherein the connection between the bulkhead and the container is such that the bulkhead can be moved between a vertical position in which it divides the load space and a horizontal position adjacent the ceiling of the load space.
7. A bulkhead as claimed in Claim 6 wherein when the bulkhead is in the vertical position the upper and lower seals are compressed between the panel and the periphery of the load space but the side seals are not.